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### **Continuous lateral oscillations as a core mechanism for taxis in *Drosophila* larvae**

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# Continuous lateral oscillations as a core mechanism for taxis in *Drosophila* larvae

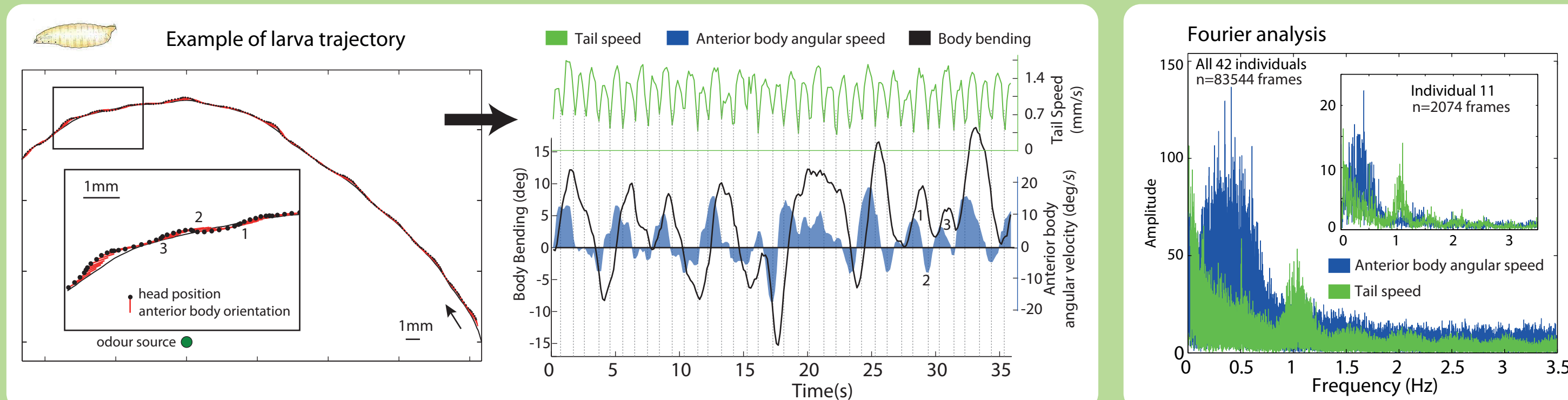


Antoine Wystrach<sup>1,2</sup>, Konstantinos Lagogiannis<sup>1</sup> and Barbara Webb<sup>1</sup>

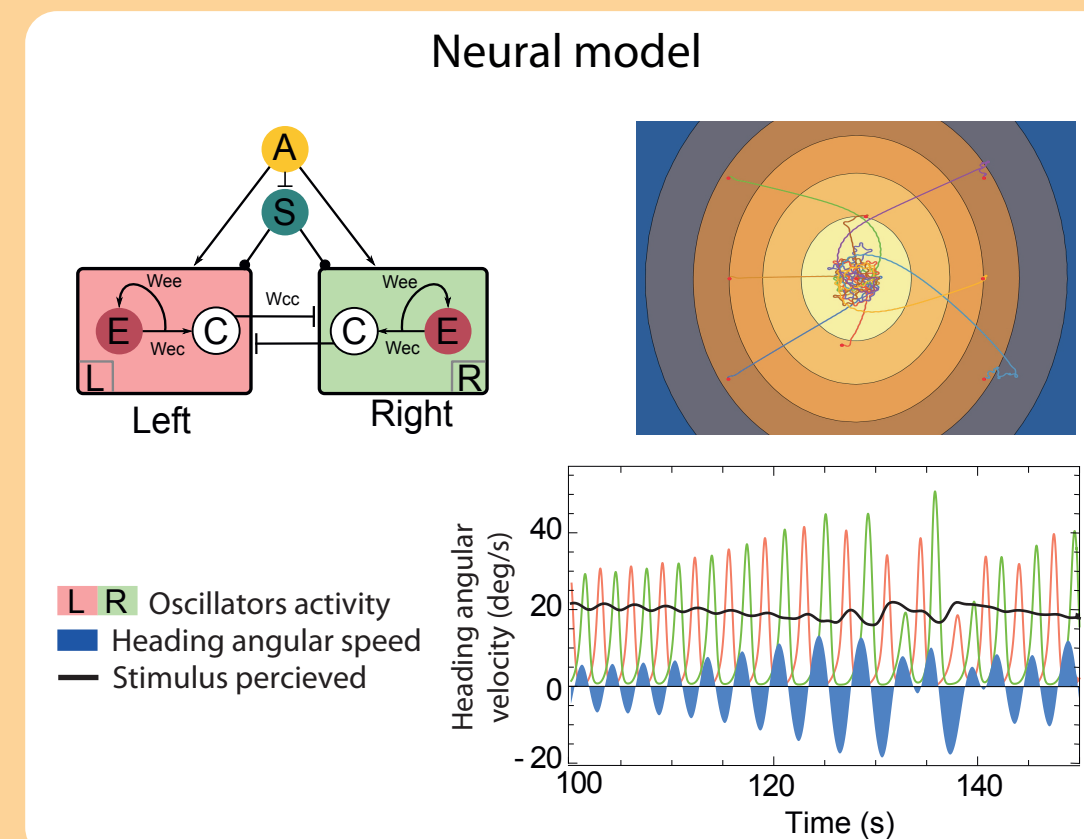
1. School of Informatics, University of Edinburgh, UK

2. Centre de recherche sur la cognition animal. CNRS. Universite de Toulouse, France

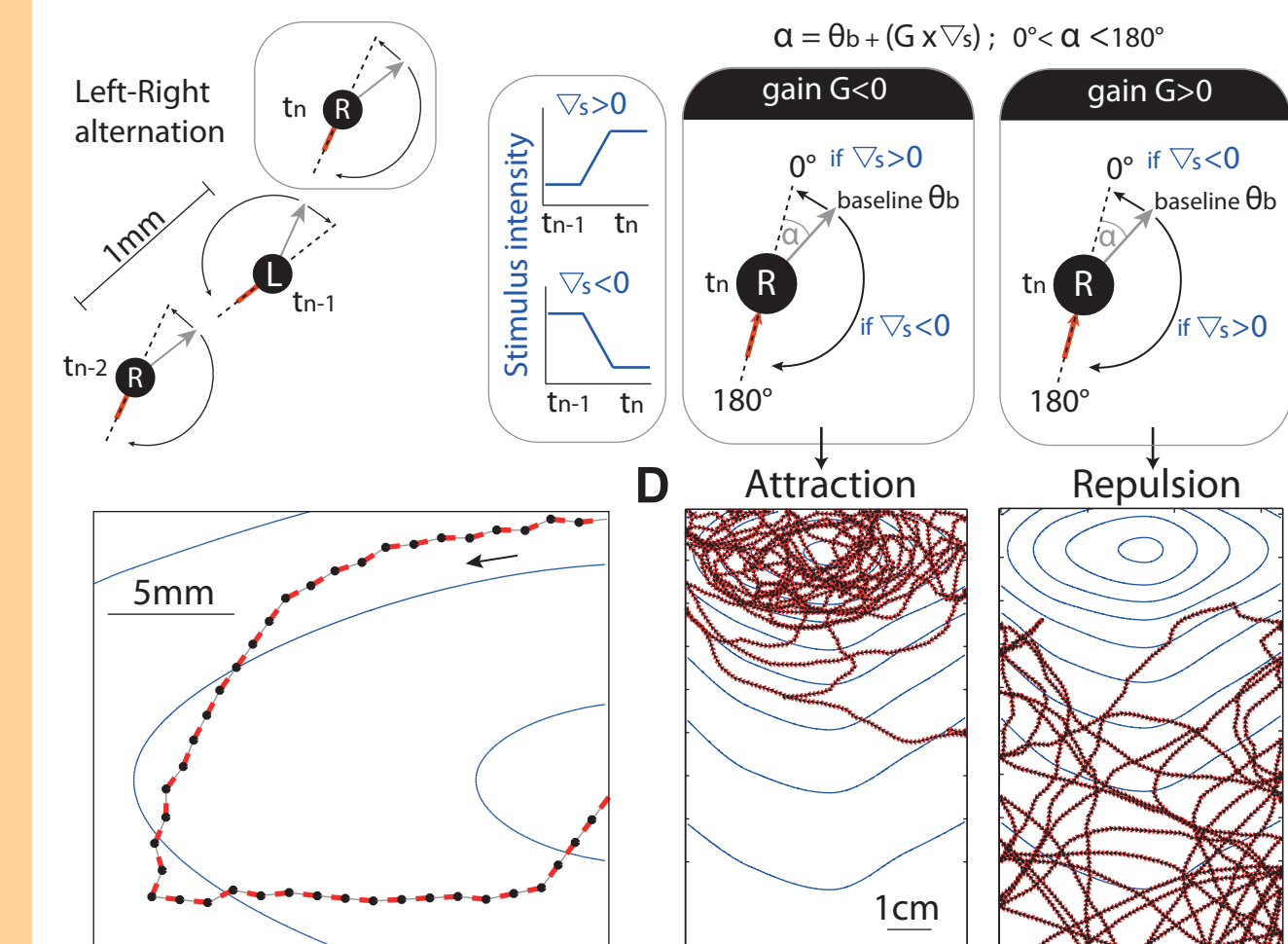
## Larvae exhibit continuous rhythmical alternations between left and right turns



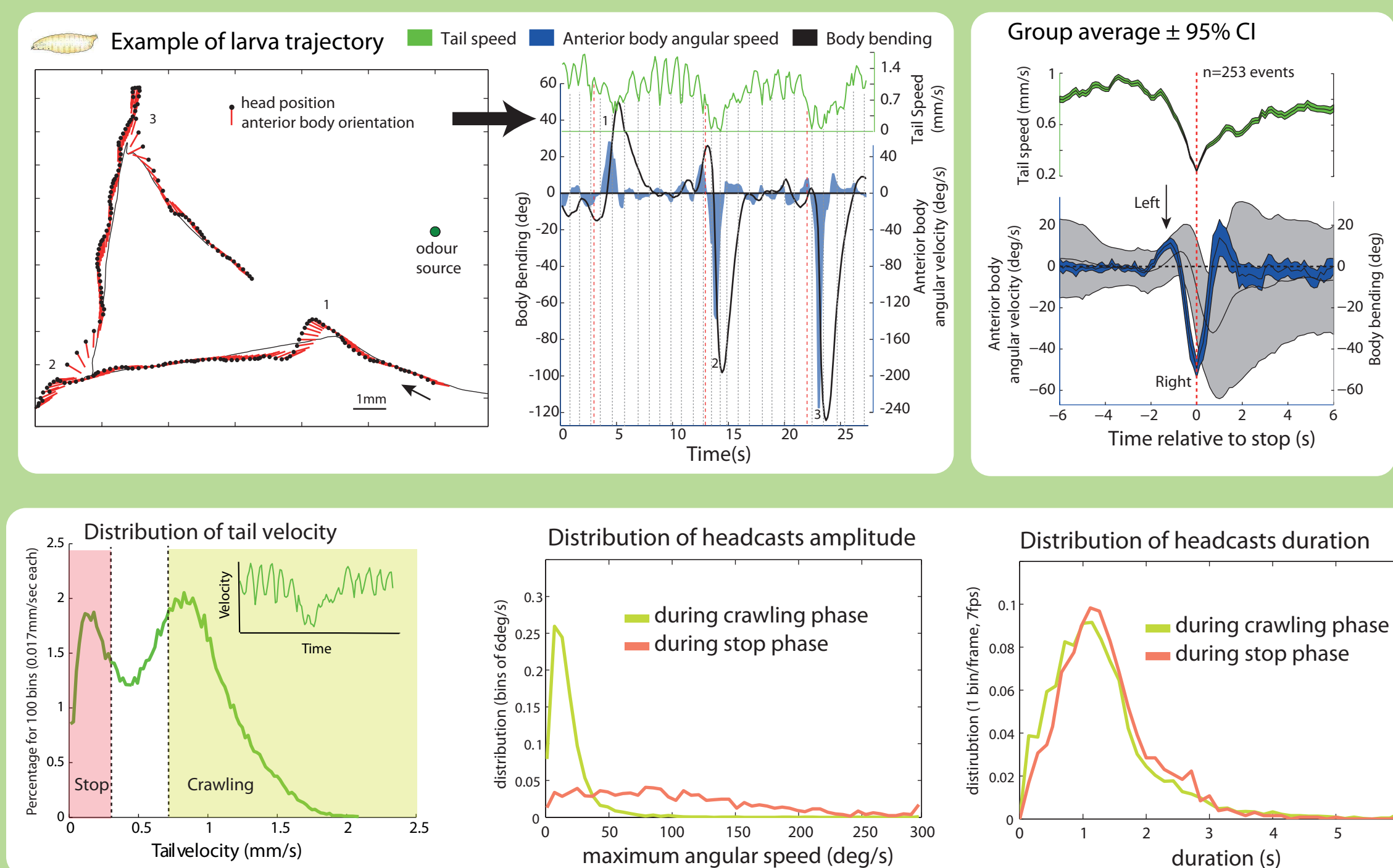
We embodied this hypothesis into simple agent based simulations



Model in discrete time



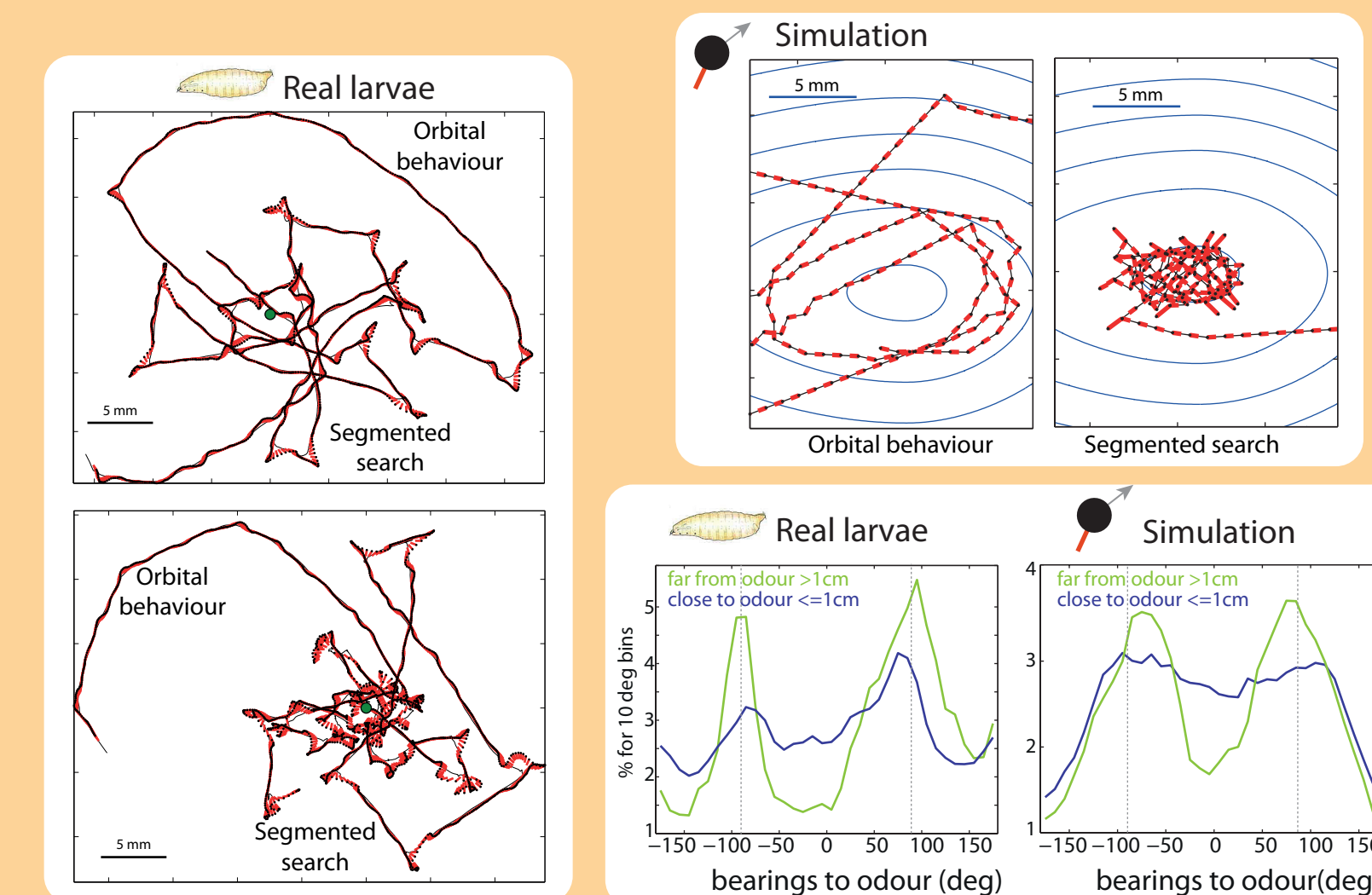
## Both small and large headcasts share the same underlying oscillatory rhythm



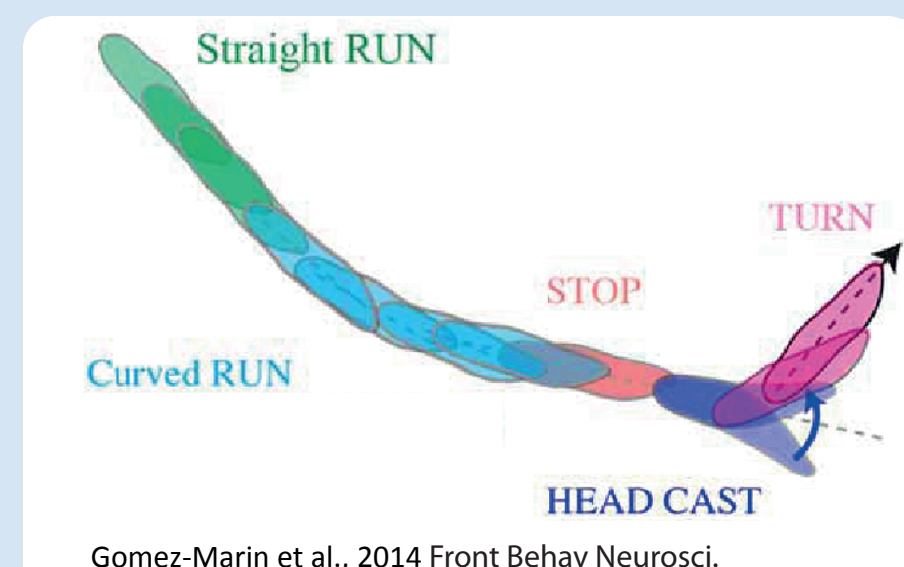
## Hypothesis

Taxis in larvae results from a continuous modulation of ongoing left-right turning oscillations

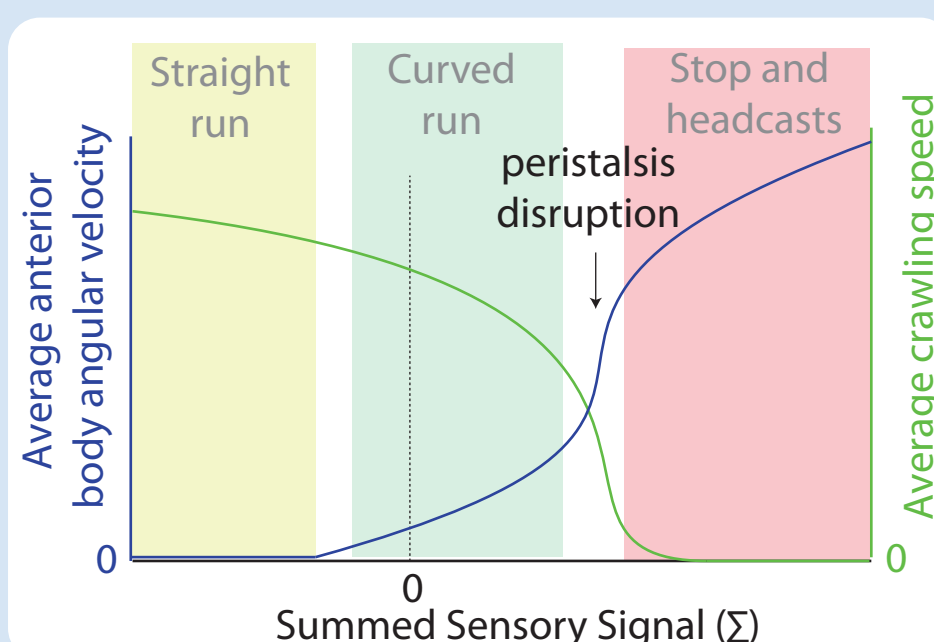
## The simulation captures taxis trajectory signatures



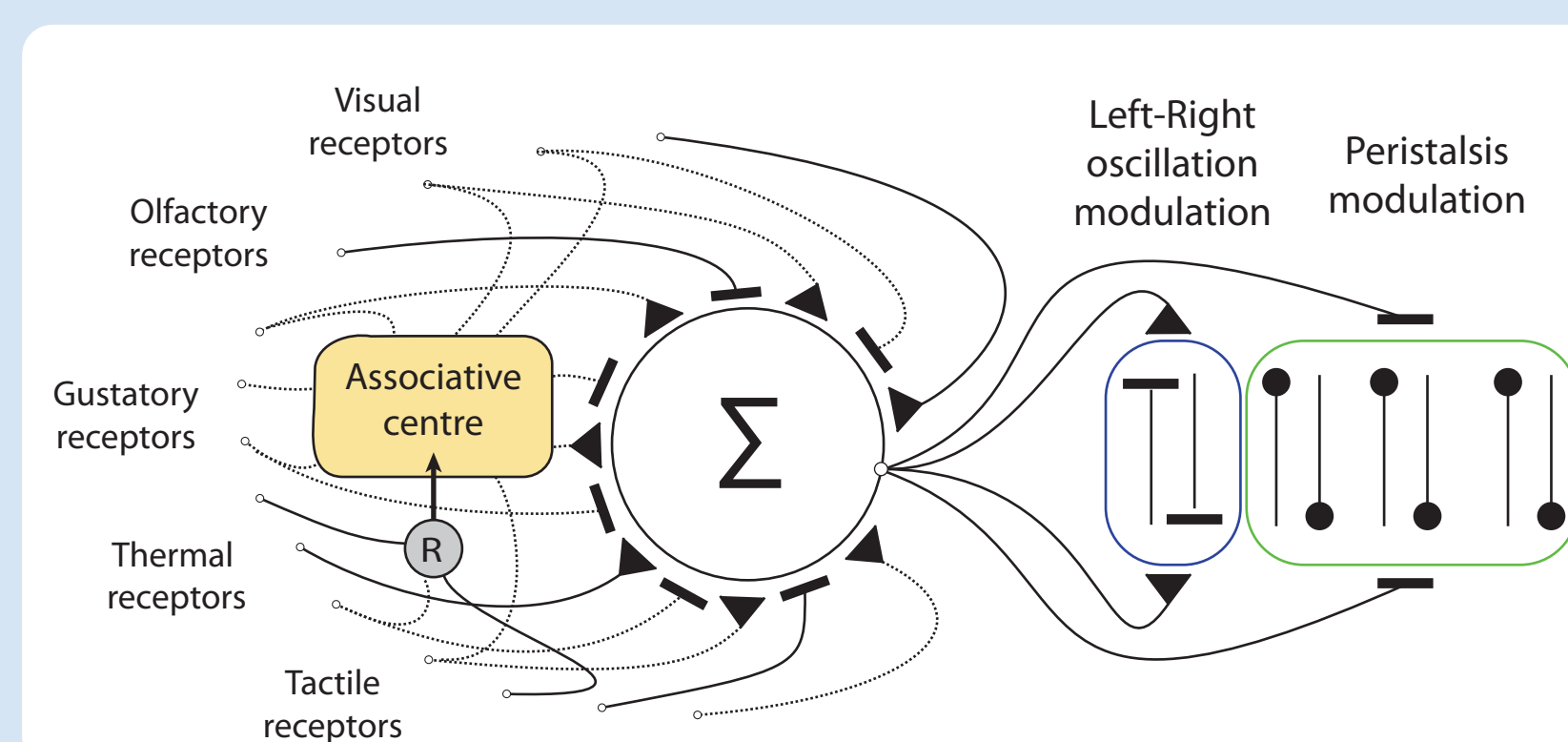
No need for 'decision making'. Seemingly discrete actions spontaneously emerge



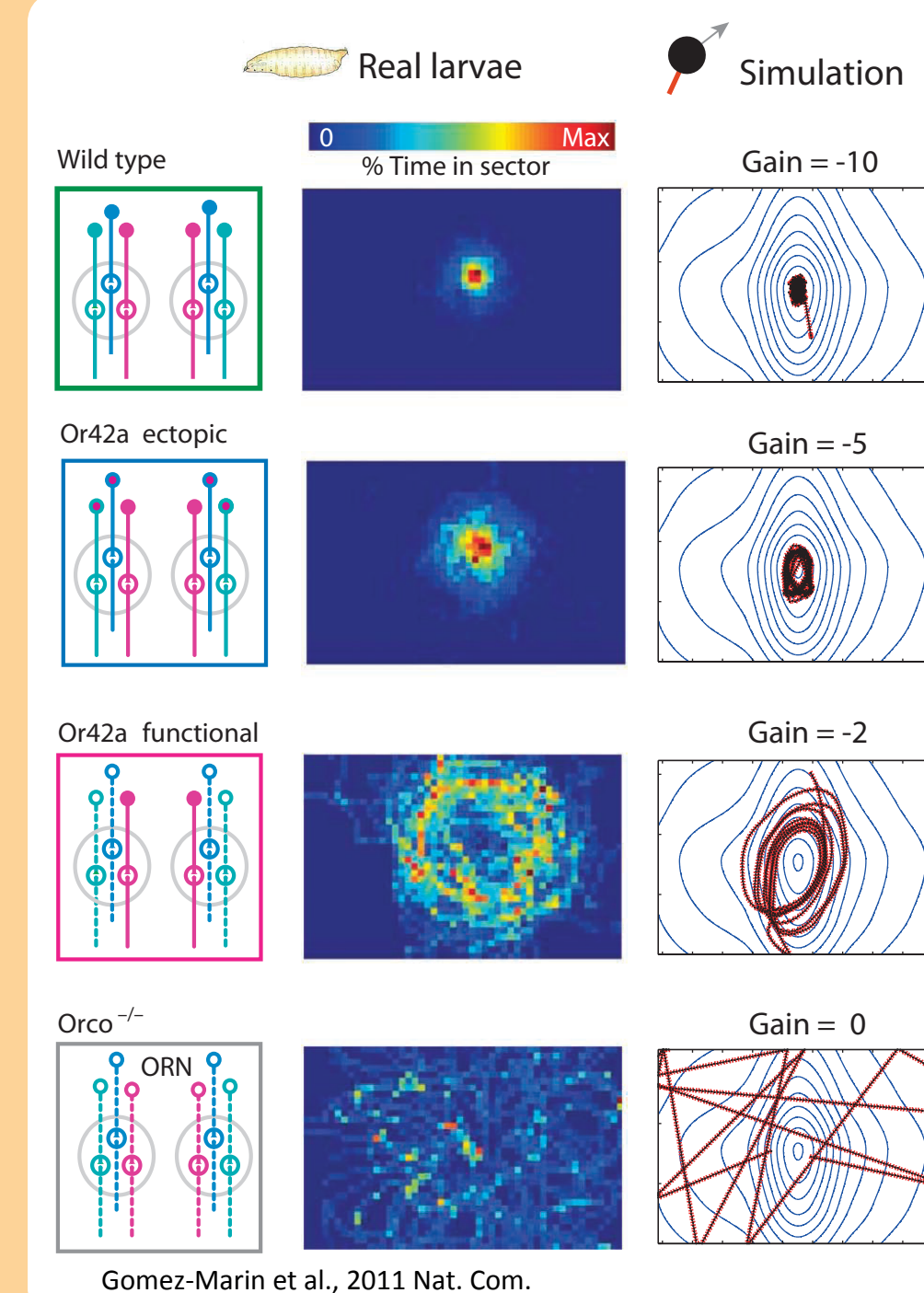
Gomez-Marin et al., 2014 Front Behav Neurosci.



## A simple solution for combining multiple modalities along both sensory and memory pathways



## Stronger sensory inputs = stronger gain



## Learning as a simple change in gain

